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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/580,961

08/30/2006

Hiroshi Kawamura

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27572 7590 10/13/2010
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EXAMINER

JOYCE, WILLIAM C

ART UNIT

PAPER NUMBER

3656

MAIL DATE

DELIVERY MODE

10/13/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/580,961 | Applicant(s) KAWAMURA ET AL. | |
| | Examiner William C. Joyce | Art Unit 3656 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-24 is/are pending in the application.
- 4a) Of the above claim(s) 14 and 19-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13, 15-18 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the amendment filed July 27, 2010 for the above identified patent application.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 13, 15, 17, 18, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibuya (JP 2002-187406) in view of Simon (USP 5,320,580).

Shibuya illustrates a vehicle wheel bearing apparatus for a wheel of vehicle comprising: an axle housing (1) supported under a body of a vehicle; a drive shaft (15) inserted into the axle housing; a wheel bearing arranged between the drive shaft and an opening of the axle housing and structured as a unit of a wheel hub and a double row rolling bearing (32); the wheel bearing comprising: an inner member (9) including a wheel hub integrally formed with a wheel mounting flange on one end and an axially extending cylindrical portion, said inner member including a hollow hole for receiving the drive shaft; at least one inner ring (28) press-fit onto the cylindrical portion of the wheel hub and said at least one inner ring with at least one inner raceway surface formed on its outer circumferential surface; an outer member (4) arranged around the inner member

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and formed with double row outer raceway surfaces on its inner circumferential surface opposite to the inner raceway surfaces, said outer member received in the opening of the axle housing; double row rolling elements (32) arranged between the inner and outer raceway surfaces of the inner member and the outer member; a cage (6a) for freely rollably holding the rolling elements; seals (43) for sealing an annular space between the inner member and the outer member; and a cap (38) press-fit into an end of the central bore of the wheel hub, the cap preventing leakage of differential gear oil to the outside.

It is not clear if the cap of Shibuya is formed of metal. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the cap of metal, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Shibuya does not teach the shaft being formed as a hollow shaft. The prior art to Simon teaches forming a drive shaft as a hollow shaft. It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the shaft of Shibuya as a hollow shaft, as taught by Simon, motivation being to reduce the weight of the device.

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With respect to claim 18 Shibuya does not teach an elastic member attached to at least the fitting portion of the cap. However, it was well known in the art to provide a sealant, such as silicone, to the engaging surfaces of two inter-fitted machine components so as to provide a leak-proof connection. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide an elastic sealant material, such as a silicone sealant to the engaging surfaces of the bore and the cap so as to provide a leak-proof connection.

With respect to claim 24, it would have been within the skill of one in the art to determine the amount of press-fit of the cap onto the hub so as to have an interference of 0.05 to 0.3 mm, to prevent the cap from falling out of the bore during operation.

3. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shibuya (JP 2002-187406) and Simon (USP 5,320,580) as applied to claim 13 above, and further in view of Yamamoto (USP 7,255,482).

The prior art to Shibuya does not disclose the hub assembly having the claimed hardened surfaces. However, the prior art to Yamamoto discloses an outer circumferential region of the wheel mounting flange from an inboard base side to the axially extending cylindrical portion is hardened by high frequency induction hardening to have a surface hardness of about 54-64 HRC, and the

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caulked portion remains unhardened to have a surface hardness of 25 HRC or less after forging. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the bearing device of Shibuya with the claimed surfaces, as taught by Yamamoto, motivation being to provide hardened wear resistant hub surfaces while prevent cracking of the caulked portion during manufacture.

4. Alternatively, claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shibuya (JP 2002-187406) and Simon (USP 5,320,580) as applied to claim 13 above, and further in view of Welschof et al. (USP 4,424,047)

Welschof et al. discloses a cap (11) having a metal core and an elastic (12) attached to part of its fitting portion. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cap of Shibuya with a metal cap having an elastic ring, as taught by Welschof et al., motivation being to provide a better seal between the cap and the hub.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Joyce whose telephone number is (571) 272-7107. The examiner can normally be reached on Monday - Thursday 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571) 272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William C. Joyce/
Primary Examiner, Art Unit 3656